GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING (Autonomous)
Approved by AICTE, New Delhi and Affiliated to JNTU-Kakinada
Re-accredited by NAAC with "A" Grade with a CGPA of 3.47/4.00
Madhurawada, Visakhapatnam - 530 048.

DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF COURSE WORK

Course Details:

Course Title	**ADVANCED STRUCTURAL ANALYSIS (Professional Elective-I)**
Course Code	**20CE1151**
L T P C	**3 0 0 3**
Program	**B.Tech.**
Specialization	**CIVIL ENGINEERING**
Semester	**VII**
Prerequisites	**Strength of Materials, Structural Analysis**
Courses to which it is a prerequisite	**-**

COURSE OUTCOMES (COs):

After completion of this course the student would be able to

CO	Course Outcomes	Learning Outcomes
1	Analyse portal frames with inclined legs and gable frames using slope deflection method.	1. Analyse portal frames with inclined legs (L4) 2. Analyse portal frames with gable frames (L4) 3. Summarize the concept of inclined legs and gable frames(L2)
2	Analyse two and three hinged arches using ILD concept.	1. Analyse the indeterminate beams using ILDs (L4) 2. Analyse the three hinged arches using ILDs (L4) 3. Analyse the two hinged arches using ILDs (L4)
3	Solve frames and trusses using Flexibility method.	1. Analyse the frames using flexibility method (L4) 2. Analyse the trusses using flexibility method (L4) 3. Analyse the frames and trusses with settlements using flexibility method(L4)
4	Solve frames and trusses using Stiffness method	1. Analyse the frames using stiffness method (L4) 2. Analyse the trusses using stiffness method (L4) 3. Analyse the frames and trusses with settlements using stiffness method(L4)
5	Analyse cables structures	1. Explain the behavior of suspension cables (L2) 2. Determine the tension in the cable supported at same and different levels (L3) 3. Determine the lengths of suspension cable when supported at the same and different levels(L3)

PROGRAMME OUTCOMES

1. Graduates will be able to apply the knowledge of mathematics, science, engineering fundamentals to solve complex civil engineering problems.

2. Graduates will attain the capability to identify, formulate and analyse problems related to civil engineering and substantiate the conclusions

3. Graduates will be in a position to design solutions for civil engineering problems and design system components and processes that meet the specified needs with appropriate consideration to public health and safety.

4. Graduates will be able to perform analysis and interpretation of data by using research methods such as design of experiments to synthesize the information and to provide valid conclusions.

5. Graduates will be able to select and apply appropriate techniques from the available resources and modern civil engineering and software tools, and will be able to predict and model complex engineering activities with an understanding of the practical limitations.

6. Graduates will be able to carry out their professional practice in civil engineering by appropriately considering and weighing the issues related to society and culture and the consequent responsibilities.

7. Graduates will be able to understand the impact of the professional engineering solutions on environmental safety and legal issues.

8. Graduates will transform into responsible citizens by resorting to professional ethics and norms of the engineering practice.

9. Graduates will be able to function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams.

10. Graduates will be able to communicate fluently on complex engineering activities with the engineering community and society, and will be able to prepare reports and make presentations effectively.

11. Graduates will be able to demonstrate knowledge and understanding of the engineering and management principles and apply the same while managing projects in multidisciplinary environments.

12. Graduates will engage themselves in independent and life-long learning in the broadest context of technological change while continuing professional practice in their specialized areas of civil engineering.

PROGRAMME SPECIFIC OUTCOMES(PSOs):

1. Collect, process and analyse the data from topographic surveys, remote sensing, hydrogeological investigations, geotechnical explorations, and integrate the data for planning of civil engineering infrastructure.

2. Analyse and design of substructures and superstructure for buildings, bridges, irrigation structures and pavements.

3. Estimate, cost evaluation, execution and management of civil engineering projects.

Course Outcome Vs Program Outcomes:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	2	-	-	-	-	-	-	-	-

CO2	3	2	-	2	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-
CO5	2	-	-	-	-	-	-	-	-	-	-	-

Course Outcome Vs Programme Specific Outcomes:

CO	PSO1	PSO2	PSO3
CO1	-	3	-
CO2	-	3	-
CO3	-	3	-
CO4	-	3	-
CO5	-	-	-

Mapping Levels:
1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), put -: No Correlation

Assessment Methods:	Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam

Teaching-Learning and Evaluation:

Week	TOPIC / CONTENTS	CO	Sample questions	Teaching- learning strategy	Assessment Method & Schedule
1	Application to the analysis of Continuous beams and simple Portal frames.	1	Using strain energy method analyse continuous beam and portal frame	• Lecture • Problem Solving	Assignment/ Quiz
2	Application to the analysis of Portal frames with inclined legs	1	Analyse portal frame with inclined edges using slope deflection method	• Lecture Problem Solving	
3	Application to the analysis of Gable frames.	1	Analyse gable frame using slope deflection method	• Lecture Problem Solving	
4	Application to the analysis of Gable frames.	1	Analyse gable frame using slope deflection method	• Lecture Problem Solving	
5	Influence line diagrams for Reaction, Shearing force and Bending moment in case of determinate beams.	2	Draw ILD for reaction and SF in determinate beams Draw ILD for BM in beams	• Lecture Problem Solving.	
6	Analysis of Three hinged arches using Influence line diagrams	2	Analyse Three hinged arch using Influence lines with different loading conditions Draw BM and SF	• Lecture Problem Solving	
7	Analysis of Two hinged arches using Influence lines.	2	Analyse Two hinged arch using Influence lines with different loading conditions	• Lecture Problem Solving	

			.Draw BM and SF		
8	**MID-I**				
9	Introduction to the Structural analysis by Flexibility concept using Matrix approach.	3	1.Analyse the beam by using Flexibility method 2.Draw SF and BM of the beam	• Lecture • Problem solving	
10	Application to portal frames	3	1. Using flexibility method analyse frame subjected to loading	• Lecture Problem solving	
11	Application to simple trusses	3	Using flexibility method analyse truss subjected to loading	• Lecture Problem solving	
12	Introduction to the Structural analysis by stiffness concept using Matrix approach.	4	1.Analyse the beam by using Flexibility method 2.Draw SF and BM of the beam	• Lecture Problem solving	
13	Application to portal frames and simple trusses	4	1.Using flexibility method analyse frame subjected to loading 2.Using flexibility method analyse truss subjected to loading	• Lecture Problem solving	Assignment/ Quiz
14	Application to portal frames and simple trusses	4	1.Using flexibility method analyse frame subjected to loading 2.Using flexibility method analyse truss subjected to loading	• Lecture Problem solving	
15	Introduction, Equation of General Cable theorem the cable,	5	Derive the equation of the cable	• Lecture Problem solving	
16	Horizontal reaction for uniformly loaded cable, Tension in the cable supported at same and different levels	5	Calculate the horizontal reaction of the cable subjected to UDL	• Lecture Problem solving	
17	Lengths of the cable when supported at the same level.	5	Calculate the lengths of the cable	• Lecture • Problem solving	
18	**MID-II**				
19	**END EXAM**				